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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Larson et al.	Attorney Docket No.: LAM1P167X2/P1066X
Application No.: 10/685,739	Examiner: Zervigon, Rudy
Filed: October 14, 2003	Group: 1763
Title: UNIFORM ETCH SYSTEM	

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APPEAL BRIEF TRANSMITTAL
(37 CFR 192)

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This application is on behalf of

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extension be granted and authorize the Commissioner to charge the required fees for an Extension of Time under 37 CFR 1.136 to Deposit Account No. 500388.

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Appeal Brief fee	$500.00
Extension Fee (if any)	$
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Respectfully submitted,
BEYER WEAVER & THOMAS, LLP

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex Parte Larson et al.

Application for Patent
Filed: October 14, 2003
Application No.: 10/685,739
Group Art Unit 1763
Examiner Rudy Zervigon

For:

UNIFORM ETCH SYSTEM

APPEAL BRIEF

Marc S. Hanish
Attorneys for Appellant

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1. REAL PARTY IN INTEREST

The real party in interest is the assignee, Lam Research Corporation. Address: 4650 Cushing Parkway, Fremont, CA 94536

2. RELATED APPEALS AND INTERFERENCES

It is believed that there are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

There are a total of 20 claims pending in this application (claims 1-20). Claims 1-20 were examined and rejected.

The claims on appeal are reproduced below in Appendix A.

4. STATUS OF AMENDMENTS

No amendment has been filed in response to the outstanding Office Action of August 15, 2006. All amendments previously filed have been entered.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1

Claim 1 recites an apparatus for providing a gas from a gas supply to at least two different zones in a process chamber. An example of this apparatus may be found in FIG. 3 and the accompanying text on page 10, line 12 through page 12, line 17. The apparatus may include a flow divider for providing a fluid connection to the gas supply, wherein the flow divider splits gas flow from the gas supply into a plurality of legs. The flow divider is depicted as 331 of FIG. 3 and the plurality of legs are depicted as 316, 318, and 320, as described on page 10, lines 23-24. The apparatus may also include a master leg in fluid connection with the flow divider, wherein the master leg comprises a master fixed orifice. The master leg is depicted as 312 in FIG. 3, with the master fixed orifice as 332, as described on page 10, lines 18-19. The apparatus may also include a first slave leg in fluid connection with the flow divider and in parallel with the master leg, wherein the first slave leg comprises a first slave leg valve and a first slave leg fixed orifice. The first slave leg is depicted as 316 in FIG. 3, with the first slave leg valve as 336 and the first slave leg fixed orifice as 334, as described on page 10, lines 23-24.

Dependent claims 9, 10, 12, and 15

Dependent claims 9, 10, 12, and 15, which will be argued separately from parent claim 1, each state that the fixed orifices are flat plate fixed orifices. A flat plate orifice is depicted in FIG. 19 and includes a flat plate 1980 with a fixed aperture placed across a diameter of a tube 1904, as described on Page 29, lines 8-10.

Independent Claim 18

Claim 18 recites an apparatus for providing a gas from a gas supply to at least two different zones in a process chamber. Like claim 1, an example of this apparatus may be found in FIG. 3 and the accompanying text page 10, line 12 through page 12, line 17. The apparatus may include a flow divider for providing a fluid connection to the gas supply, wherein the flow divider splits gas flow from the gas supply into a plurality of legs. The flow divider is depicted as 331 of FIG. 3 and the plurality of legs are depicted as 316, 318, 320, and 320, as described on page 10, lines 23-24. The apparatus may also include a master leg in fluid connection with the flow divider, wherein the master leg comprises a master fixed orifice. The master leg is depicted as 312 in FIG. 3, with the master fixed orifice as 332, as described on page 10, lines 18-19. The apparatus may also include a first slave leg in fluid connection with the flow divider and in parallel with the master leg, wherein the first slave leg comprises a first slave leg valve and a first slave leg fixed orifice. The first slave leg is depicted as 316 in FIG. 3, with the first slave leg valve as 336 and the first slave leg fixed orifice as 334, as described on page 10, lines 23-24. The apparatus may also include a second slave leg in fluid connection with the flow divider and in parallel with the master leg and the first slave leg, wherein the second slave leg comprises a second slave leg valve and a second slave leg fixed orifice. The second slave leg is depicted as 318 in FIG. 3, with the second slave leg valve as 339 and the second slave leg fixed orifice as 338, as described on page 10, lines 30-31. The apparatus may also include a third slave leg in fluid connection with the flow divider and in parallel with the master leg, the first slave leg, and the second slave leg, wherein the third slave leg comprises a third slave leg valve and a third slave leg fixed orifice. The third slave leg is depicted as 320 in FIG. 3, with the third slave leg valve as 344 and the third slave leg fixed orifice as 342, as described on page 11, lines 4-7. The apparatus may also include a tuning gas system in fluid connection with at least one of the master leg, first slave leg, second slave leg, and third slave leg. This tuning gas system may comprise at least one tuning gas source, at least one mass flow controller, and a zone selection device connected to the master leg down stream from the master fixed orifice. The tuning gas system is depicted as 360, 362, and 340, as described on page 11, lines 8-19. The tuning gas source is depicted as 360, the mass flow controller as 362, and the zone selection device as 340. The tuning gas system is depicted as connecting to the master leg in FIG. 3 at a point down stream from the master fixed orifice 332, as described on page 11, lines 17-19. .

Dependent Claim 19

Dependent claim 19, which will be argued separately from parent claim 18, recites a joining manifold for combining output from the first slave leg, the second slave leg, and the third slave leg connected between the first slave leg, the second slave leg, and third slave leg and a zone of the at least two zones of the process chamber. This joining manifold is depicted as 333 of FIG. 3, and is described on page 10, lines 23-25.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. The rejection of claims 1-3, 17, 19, and 20 under 35 U.S.C. 102(e) as being anticipated by Motoda et al. (US 5,496,408).

B. The rejection of claims 4-7, 9, 10, 12 and 15 under 35 U.S.C. 103(a) as being unpatentable over Motoda et al. (US 5,496,408) in view of Shinozuka, Shyuhei et al. (U.S. Patent No. 6,315,858).

C. The rejection of claims 8, 11, 13, 14, 17 and 18 under 35 U.S.C. 103(a) as being unpatentable over Motoda et al. (US 5,496,408) and Shyuhei et al. (US 6,315,858) in view of Tadahiro et al. (U.S. Patent No. 5,313,982).

All grounds are to be reviewed on Appeal.

7. ARGUMENT

A. The rejection of claims 1-3, 17, 19, and 20 under 35 U.S.C. 102(e) as being anticipated by Motoda et al. (US 5,496,408).

Claims 1-3, 17, and 20

Claims 1-3, 17, and 20 were rejected under 35 U.S.C. 102(e) as being allegedly anticipated by Motoda. Specifically, the Examiner argues that Motoda's slave legs contain orifices because all piping have orifices (See Final Office Action, page 2). The major point of contention is the definition of the term "fixed orifice" as used in the claims. Applicant has proposed a definition that would preclude Motoda from being used to teach this element. The Examiner has provided no prior art that teaches or suggests the claims as interpreted using Applicant's definition of the term "fixed orifice." As such, it appears that the claims would be allowable over the prior art if Applicant's definition were accepted.

Those of ordinary skill in the art recognize that the term "fixed orifice" in the context of the patent application means "a fixed flat plate body, containing a precision fixed geometry." Evidence of this difference is provided in the declaration of Dean Larson, which is of record in the patent file.

The Applicant's definition is based on what one of ordinary skill in the art would understand the term to mean after having reviewed the specification. In addition to pointing out that the Applicant's definition is consistent with the specification, Applicant has also provided evidence in the form of a declaration of one of ordinary skill in the art attesting to the meaning of the term in the context of the patent application. By relying both on what one of ordinary skill in the art would understand the term to mean, and what the specification indicates the term should mean, the Applicant's definition complies with the rules regarding claim interpretation defined in M.P.E.P. 2111.

M.P.E.P. 2111 states that "[d]uring patent examination, the pending claims must be given their broadest reasonable interpretation **consistent with the specification.**" (emphasis added). It then goes on to state that "[t]he broadest reasonable interpretation of the claims must also be consistent with the interpretation that those **skilled in the art would reach.**" (emphasis added).

The Examiner's definition, however, is based solely on a definition in a general collegiate dictionary of each word deparately, instead of the entire phrase as a whole. The Examiner makes no effort to determine the meaning of the term to one of ordinary skill in the art, and instead jumps right to the meaning of just the word "orifice" to those unskilled in the art. The Examiner also makes no effort to determine whether the selected definition is consistent with or rebutted by statements in the specification. This position is contrary to the rules regarding claim interpretation defined in M.P.E.P. 2111.

The examiner claims that the dictionary provides a definition of "fixed orifice," however the definition provided by the examiner only defines "orifice". While the dictionary may define the separate words "fixed" and "orifice," the term "fixed orifice" is a term of art with specific meaning to those of ordinary skill in the art. Therefore, it is inappropriate to break the term into component parts and define each part individually, then combine the definition, as the Examiner is apparently attempting. It is also inappropriate for the definition to be based on terms in a general collegiate dictionary when evidence has been provided that the term has a specific meaning to those of ordinary skill in the art.

The Applicant recognizes that during prosecution terms in claims are to be given their broadest reasonable interpretation. However, M.P.E.P. 2111.01 provides that in order to be "reasonable", this interpretation must be one that is understood by those of ordinary skill in the art and also must be consistent with the usage of the term in the specification. M.P.E.P. 2111.01 does not permit the Examiner to ignore the specification and ignore the understanding of those of ordinary skill in the art.

As an analogy, assume a claim in a patent included a software program executable on a computer, the software including "a driver". The term "driver" can have many meanings, including a type of golf club, and a person who operates a moving vehicle. However, one of ordinary skill in the art recognizes that the usage in the claim, in light of a specification describing a software driver, would mean "software that allows a hardware component to operate". Despite the fact that a collegiate dictionary provided definitions based on a golf club and a person that operates a moving vehicle, it would not be appropriate for an Examiner to select a definition that was so broad to include such objects. Such an interpretation would not be reasonable as it ignores what one of ordinary skill in the art (in the example, the software arts) understands by the term.

Furthermore, in the present case, the specification uses the term "fixed orifice" in a way that is consistent with the Applicant's proposed definition and in such a way that is inconsistent with the Examiner's overbroad definition. The specification indicates that a fixed orifice's purpose is to provide a specific resistance. The Examiner's definition is so broad as to allow an opening that provides no resistance at all, or a variable resistance, and thus is contrary to the usage of the term in the patent application. In light of these facts, it is requested that Applicant's definition of the term "fixed orifice" be adopted as it is the definition known to those of ordinary skill in the art and is consistent with the specification.

The Motoda reference teaches a pipe. This point is undisputed. Applicant respectfully submits that the evidence shows that the term "fixed orifice" does not include merely a pipe. Therefore, Applicant respectfully submits that the Motoda reference does not teach or suggest each of the elements in claims 1-3, 17, and 20 and that these claims are allowable.

Claim 19

Claim 19 is dependent upon claim 18, which stands rejected under 35 U.S.C. 103(a) as being unpatentable over Motoda et al. (US 5,496,408) and Shyuhei et al. (US 6,315,858) in view of Tadahiro et al. (U.S. Patent No. 5,313,982). Claim 19, however, is rejected under 35 U.S.C. 102(e) over Motoda. It is unclear how claim 19 can be rejected under 35 U.S.C. 102(e) while the claim upon which it depends, claim 18, is rejected under 35 U.S.C. 103(a). It is possible this was merely a typographical error in the Office Actions, and that the Examiner meant that claim 18 was rejected under 35 U.S.C. 102(e), but then no support is provided for the rejection of claim 19. Therefore, Applicant maintains that even if claims 1-3, 17, and 20 remain rejected, claim 19 is independently patentable.

Furthermore, since claim 19 is dependent upon claim 18, the arguments below with respect to claim 18 are equally applicable here and are hereby incorporated by reference. For these reasons, Applicant respectfully submits that claim 19 is allowable.

B. The rejection of claims 4-7, 9, 10, 12 and 15 under 35 U.S.C. 103(a) as being unpatentable over Motoda et al. (US 5,496,408) in view of Shinozuka, Shyuhei et al. (U.S. Patent No. 6,315,858).

Claims 4-7

Dependent claims 4-7 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Motoda in view of Shyuhei. Since these claims are dependent upon claim 1, Applicant respectfully submits that these claims are allowable for the same reasons as for claim 1 described above, which are incorporated by reference. Applicant does not intend to argue these claims separately from the argument for claim 1. As such, Applicant respectfully submits that claims 4-7 are allowable.

Claims 9, 10, 12, and 15

Dependent claims 9, 10, 12, and 15 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Motoda in view of Shyuhei. Claims 9, 10, 12, and 15 explicitly recite a "flat plate fixed orifice." The arguments described above with respect to the Motoda reference and claims 1-3, 17, 19, and 20 are equally applicable here, and are incorporated by reference, since claims 9, 10, 12, and 15 are ultimately dependent on claim 1.

Furthermore, the Examiner argues that the iris valve in Shinozuka teaches a flat plate fixed orifice. Applicant respectfully disagrees. The Examiner utilizes a definition of "orifice" from a Collegiate Dictionary to define a fixed orifice as "an opening through which something may pass". In doing so, however, the Examiner ignores the "fixed" portion of the term "fixed orifice". A fixed orifice can be contrasted to an orifice that is "variable." A fixed orifice would be an orifice whose opening size is not adjustable, or at least not easily adjustable. A variable orifice, on the other hand, would be one whose opening size could be easily adjusted.

An iris valve is variable, in that the size of its opening can be easily adjusted, much like the iris of a human eye can dilate in low light conditions. This variable nature of the iris introduces contaminants and complexities into the system. Indeed, the Examiner appears to agree that the iris valve is variable (See Final Office Action, page 12). The Examiner argues, however, that once the iris valve is set at a particular opening size, it becomes "fixed." As will be discussed in more detail below, however, this renders the term "fixed" meaningless.

In a prior amendment, the Applicant pointed out that the iris valve referred to in Shinozuka is variable, not fixed. In response to this argument, the Examiner states: "because Shinozuka's 'variable orifice' iris vale has the capacity of operating as a 'fixed orifice', by setting its opening area and maintaining it constant, then Shinozuka's 'variable orifice' iris valve is capable of performing the intended use and thus provides a 'fixed orifice.'" Applicant respectfully disagrees. Merely because a variable orifice can be placed in one position for a long time, it does not change the orifice into a fixed orifice. Rather, a variable orifice is one whose internal size can easily be adjusted, while a fixed orifice is one whose internal size cannot easily be adjusted. Shinozuka's iris valve can alter its internal size in order to change air flow, and as such is not fixed. A fixed orifice, as provided by Applicant's definition, must provide a specific resistance, not many different resistances based upon the whim of the operator.

Applicant also notes that the Examiner's interpretation of the term "fixed orifice" renders the term "fixed" nearly meaningless. Specifically, since the Examiner believes that an orifice that can easily alter its internal size such as an iris valve constitutes a "fixed orifice", that means that the examiner believes that a variable orifice is "fixed" merely because it can be set at a particular size at some instant in time. With such a broad interpretation, that would mean that the term "fixed" is meaningless because every orifice in the universe would fit the Examiner's definition of "fixed orifice."

The Federal Circuit recently dealt with a similar issue in Curtiss-Wright Flow Control Corp. v. Velan, Inc., 438 F.3d 1374 (Fed. Cir. 2006) (a copy of this case is provided in the Evidence Appendix as Exhibit A). In that case, a claim included the limitation "an adjustable dynamic, live loaded seat." The district court interpreted the term "adjustable" to mean "not limited by any time, place, manner, or means of adjustment." The Federal Circuit reversed, noting that "[t]he district court's construction of 'adjustable,' renders that limitation nearly meaningless. This court finds it difficult, if not impossible, to imagine any mechanical device that is not 'adjustable,' under the ordinary meaning of the term adopted by the district court. Almost any mechanical device undergoes change (for instance, when dismantled to replace worn parts) when no consideration is given to the 'time, place, manner, or means of adjustment." *Id.* at 1379.

In the present case, any orifice will remain at a particular size or location for some snapshot of time. Even the iris of the human eye may remain at a particular size in steady light conditions, or in the extreme, upon death. Interpreting the term "fixed orifice" to include such fleeting instances where a particular size is held would render the term "fixed" meaningless in the claims, and would be contrary to the holding in *Curtiss-Wright*. An iris valve is clearly variable, not fixed. The use of an iris valve introduces contaminants into the system because a feedback loop is created, constantly making minor adjustments to the size of the iris valve and reducing the stability of the system.

Lastly, the Office Action then argues that Shinozuka's "variable orifice" should be treated as reading upon a "fixed orifice" because "[w]hen the structure recited in the references is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. MPEP 2112.01." Applicant respectfully submits that the Examiner has misapplied this section of the MPEP. Indeed, items which are structurally equivalent are presumed to have the same functions and/or properties. However, in this case the structures are quite different. In once instance, the structure is capable altering its internal size when in another instance it is not capable of altering its internal size. The fact that a variable orifice could be placed into a single position and kept there reflects a potential functional equivalence between the structures, but not a structural one. In other words, while the iris valve may be capable of being substituted for a fixed orifice as it may perform the same "intended use", that does not make it an identical structure. As such, M.P.E.P. 2112.02 is misapplied in this instance.

Therefore, Applicant respectfully submits that claims 9, 10, 12, and 15 are allowable.

C. The rejection of claims 8, 11, 13, 14, 17 and 18 under 35 U.S.C. 103(a) as being unpatentable over Motoda et al. (US 5,496,408) and Shyuhei et al. (US 6,315,858) in view of Tadahiro et al. (U.S. Patent No. 5,313,982).

Claims 8, 11, 13, 14, 17, 18.

Claims 8, 11, 13, 14, 17, and 18 were rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Motoda and Shyuhei in view of Tadahiro. The arguments described above with respect to the Motoda reference and claims 1-3, 17, and 20 are equally applicable here, and are incorporated by reference, since claims 8, 11, 13, 14, and 17 are ultimately dependent on claim 1.

As described above, it is unclear under what basis claim 18 is rejected. Nevertheless, Applicant believes that the "fixed orifice" analysis regarding the Motoda reference and claim 1 would apply equally to claim 18, since the term "fixed orifice" appears in both claims. As such, Applicant does not intend to argue claims 8, 11, 13, 14, 17, and 18 separately from claim 1. Therefore, Applicant respectfully submits that claims 8, 11, 13, 14, 17, and 18 are allowable.

Conclusion

Accordingly, it is respectfully requested that the Board reverse the Examiner's rejections and remand the application to the Examiner with directions to allow all claims.

Respectfully submitted,

Marc S. Hanish
Registration No. 42,626

Attorneys for Appellant

8. CLAIMS APPENDIX

CLAIMS ON APPEAL

1. (Original) An apparatus for providing a gas from a gas supply to at least two different zones in a process chamber, comprising:

a flow divider for providing a fluid connection to the gas supply, wherein the flow divider splits gas flow from the gas supply into a plurality of legs;

a master leg in fluid connection with the flow divider, wherein the master leg comprises a master fixed orifice; and

a first slave leg in fluid connection with the flow divider and in parallel with the master leg, wherein the first slave leg comprises:

a first slave leg valve; and

a first slave leg fixed orifice.

2. (Original) The apparatus, as recited in claim 1, further comprising:

a second slave leg in fluid connection with the flow divider and in parallel with the master leg and the first slave leg, wherein the second slave leg comprises:

a second slave leg valve; and

a second slave leg fixed orifice.

3. (Original) The apparatus, as recited in claim 2, further comprising:

a third slave leg in fluid connection with the flow divider and in parallel with the master leg, the first slave leg, and the second slave leg, wherein the third slave leg comprises:

a third slave leg valve; and

a third slave leg fixed orifice.

4. (Original) The apparatus, as recited in claim 3, further comprising:

a fourth slave leg in fluid connection with the flow divider and in parallel with the master leg, the first slave leg, the second slave leg, and the third slave leg, wherein the fourth slave leg comprises:

a fourth slave leg valve; and

a fourth slave leg fixed orifice; and

a fifth slave leg in fluid connection with the flow divider and in parallel with the master leg, the first slave leg, the second slave leg, the third slave leg, and the fourth slave leg, wherein the fifth slave leg comprises:

a fifth slave leg valve; and

a fifth slave leg fixed orifice.

5. (Original) The apparatus, as recited in claim 4, further comprising a tuning gas system in fluid connection with at least one of the master leg, first slave leg, second slave leg, third slave leg, fourth slave leg, and fifth slave leg.

6. (Original) The apparatus, as recited in claim 5, wherein the tuning gas system comprises:

at least one tuning gas source; and

at least one mass flow controller.

7. (Original) The apparatus, as recited in claim 6, wherein the tuning gas system is in fluid connection with the master leg down stream from the master fixed orifice.

8. (Original) The apparatus, as recited in claim 7, further comprising a zone selection device connected to the master leg down stream from the master fixed orifice.

9. (Original) The apparatus, as recited in claim 8, wherein the first, second, third, fourth, and fifth leg fixed orifices are flat plate fixed orifices.

10. (Original) The apparatus, as recited in claim 4, wherein the first, second, third, fourth, and fifth leg fixed orifices are flat plate fixed orifices.

11. (Original) The apparatus, as recited in claim 10, further comprising a zone selection device connected to the master leg down stream from the master fixed orifice.

12. (Original) The apparatus, as recited in claim 3, wherein the first, second, and third leg fixed orifices are flat plate fixed orifices.

13. (Original) The apparatus, as recited in claim 12, further comprising a zone selection device connected to the master leg down stream from the master fixed orifice.

14. (Original) The apparatus, as recited in claim 3, further comprising a zone

selection device connected to the master leg down stream from the master fixed orifice.

15. (Original) The apparatus, as recited in claim 1, wherein the master fixed orifice and the first leg fixed orifices are flat plate fixed orifices.

16. (Original) The apparatus, as recited in claim 15, further comprising a zone selection device connected to the master leg down stream from the master fixed orifice.

17. (Original) A semiconductor chip formed using the apparatus, as recited in claim 1.

18. (Original) An apparatus for providing a gas from a gas supply to at least two different zones in a process chamber, comprising:

a flow divider for providing a fluid connection to the gas supply, wherein the flow divider splits gas flow from the gas supply into a plurality of legs;

a master leg in fluid connection with the flow divider, wherein the master leg comprises a master flat plate fixed orifice;

a first slave leg in fluid connection with the flow divider and in parallel with the master leg, wherein the first slave leg comprises:

a first slave leg valve; and

a first slave leg flat plate fixed orifice;

a second slave leg in fluid connection with the flow divider and in parallel with the master leg and the first slave leg, wherein the second slave leg comprises:

a second slave leg valve; and

a second slave leg flat plate fixed orifice;

a third slave leg in fluid connection with the flow divider and in parallel with the master leg, the first slave leg, and the second slave leg, wherein the third slave leg comprises:

a third slave leg valve; and

a third slave leg flat plate fixed orifice;

a tuning gas system in fluid connection with at least one of the master leg, first slave leg, second slave leg, and third slave leg, wherein the tuning gas system comprises:

at least one tuning gas source; and

at least one mass flow controller; and

a zone selection device connected to the master leg down stream from the master fixed orifice.

19. (Previously Presented) The apparatus, as recited in claim 18, further comprising a joining manifold for combining output from the first slave leg, the second slave leg, and the third slave leg connected between the first slave leg, the second slave leg, the third slave leg and a zone of the at least two zones of the process chamber.

20. (Previously Presented) The apparatus, as recited in claim 3, further comprising a joining manifold for combining output from the first slave leg, the second slave leg, and the third slave leg connected between the first slave leg, the second slave leg, the third slave leg and a zone of a process chamber.

9. EVIDENCE APPENDIX

EXHIBIT A

438 F.3d 1374, 77 U.S.P.Q.2d 1988
(Cite as: 438 F.3d 1374)

H

Briefs and Other Related Documents
Curtiss-Wright Flow Control Corp. v. Velan, Inc.C.A.Fed.,2006.
United States Court of Appeals,Federal Circuit.
CURTISS-WRIGHT FLOW CONTROL CORP., Plaintiff-Appellee,
v.
VELAN, INC., Defendant-Appellant.
No. 05-1373.

Feb. 15, 2006.

Background: Owner of patent for coke drum deheading system sued competitor for infringement. The United States District Court for the Western District of Texas, Orlando L. Garcia, J., granted preliminary injunction for owner, and competitor appealed.

Holding: The Court of Appeals, Rader, Circuit Judge, held that claim limitation, that live-loaded valve seat be "adjustable," was not properly construed.

Vacated and remanded.
West Headnotes
[1] Patents 291 ⇨324.54

291 Patents
  291XII Infringement
    291XII(C) Suits in Equity
      291k324 Appeal
        291k324.54 k. Presumptions and Discretion of Lower Court. Most Cited Cases
Grant of preliminary injunction for patent infringement plaintiff is reviewed for abuse of discretion. 35 U.S.C.A. § 283.

[2] Patents 291 ⇨324.5

291 Patents
  291XII Infringement
    291XII(C) Suits in Equity
      291k324 Appeal
        291k324.5 k. Scope and Extent of Review in General. Most Cited Cases
District court's patent claim construction is reviewed without deference.

[3] Patents 291 ⇨167(1)

291 Patents
  291IX Construction and Operation of Letters Patent
    291IX(B) Limitation of Claims
      291k167 Specifications, Drawings, and Models
        291k167(1) k. In General. Most Cited Cases
Specification is single best guide to meaning of patent claim term.

[4] Patents 291 ⇨165(5)

291 Patents
  291IX Construction and Operation of Letters Patent
    291IX(B) Limitation of Claims
      291k165 Operation and Effect of Claims in General
        291k165(5) k. Construction of Particular Claims as Affected by Other Claims. Most Cited Cases
Patent construction doctrine of "claim differentiation" refers to presumption that independent claim should not be construed as requiring limitation added by dependent claim.

[5] Patents 291 ⇨165(5)

291 Patents
  291IX Construction and Operation of Letters Patent
    291IX(B) Limitation of Claims

291k165 Operation and Effect of Claims in General
291k165(5) k. Construction of Particular Claims as Affected by Other Claims. Most Cited Cases
Two patent claims with different terminology can define exact same subject matter; doctrine of claim differentiation is guide, not rigid rule.

[6] Patents 291 🔑165(5)

291 Patents
291IX Construction and Operation of Letters Patent
291IX(B) Limitation of Claims
291k165 Operation and Effect of Claims in General
291k165(5) k. Construction of Particular Claims as Affected by Other Claims. Most Cited Cases
Relevant considerations when applying doctrine of claim differentiation to two independent patent claims are: (1) need to avoid construction that would render additional, or different, language in another independent claim superfluous, and (2) need to avoid broadening claims beyond their correct scope.

[7] Patents 291 🔑101(3)

291 Patents
291IV Applications and Proceedings Thereon
291k101 Claims
291k101(3) k. Limitations in General. Most Cited Cases
Correct construction of limitation in patent claim for coke drum deheading system, that live-loaded valve seat be "adjustable," had to take into consideration specification's explanation that purpose of invention was to allow seat adjustment during drum operation and without removal of head unit.

Patents 291 🔑328(2)

291 Patents
291XIII Decisions on the Validity, Construction, and Infringement of Particular Patents
291k328 Patents Enumerated
291k328(2) k. Original Utility. Most Cited Cases
6,565,714. Construed.

Patents 291 🔑328(2)

291 Patents
291XIII Decisions on the Validity, Construction, and Infringement of Particular Patents
291k328 Patents Enumerated
291k328(2) k. Original Utility. Most Cited Cases
6,660,131. Cited.

*1375 Mark M. Supko, Crowell & Moring LLP, of Washington, DC, argued for plaintiff-appellee. With him on the brief were Mark H. Neblett and John R. Perkins, Jr.
Willem G. Schuurman, Vinson & Elkins L.L.P., of Austin, Texas, argued for defendant-appellant. With him on the brief were Michael J. Smith, Adam V. Floyd, Michael A. Valek and H. Kenneth Prol.

Before RADER, Circuit Judge, FRIEDMAN, Senior Circuit Judge, and DYK, Circuit Judge.
RADER, Circuit Judge.
The United States District Court for the Western District of Texas issued a preliminary injunction in favor of **Curtiss-Wright** Flow Control Corporation (**Curtiss-Wright**). After construing claims of U.S. Patent No. 6,565,714 (the '714 patent), the trial court determined that **Curtiss-Wright** had shown a likelihood of success on the merits of its infringement action against Velan, Inc. *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, Civil Action No. SA-04-CA-1157-OG, slip op. at 18 (W.D.Tex.2005) (*Preliminary Injunction Order*). Because the district court erred in its construction of the term "adjustable," this court vacates the preliminary injunction and remands.

I.

As described in the '714 patent, petroleum refineries recover valuable products from the heavy residual oil that is a byproduct of the refining process. '714 patent, col. 1, ll. 20-60. That recovery process is known as "delayed coking." *Id.* Delayed coking heats the liquid petroleum residue to very high temperatures and then feeds the heated residue into a "coke drum." In the drum, cracking and polymerization converts the liquid residue into valuable distillates and solid coke. *Id.* A typical coke drum might be 120 feet high and 30 feet in diameter with openings at the top and bottom. These openings have large, flanged metal plates known as "heads." When the drum is full, the operators purge the byproducts and "de-head" the drum. During de-heading, the operators manually remove the top and bottom heads to remove the solid coke. *Id.* De-heading is both difficult and dangerous. Coke drums are very hot and the heads can weigh four tons. During removal, heated residues and coke can spill out and injure nearby workers. *Id.*

Curtiss-Wright's '714 patent claims a system and a method that de-heads the coke drum without manually removing the heads. '714 patent, col. 3, ll. 45-60. Instead, the de-heading system of the '714 patent includes a dual seated, linear motion, blind gate valve, i.e., a "de-header valve." *Id.* The upper and lower seats have aligned circular openings that make a single hole at, for example, the bottom of the coke drum. The blind moves linearly, horizontally between the two seats to open and close the hole at the base of the coke drum.

Figure 2 of a related patent, U.S. Patent No. 6,660,131 (the '131 patent), [FN1] shows this type of de-header valve 12 attached to a coke drum 18. Figure 11 of the '131 patent, also reproduced below, shows the internal details of the de-header valve 12. [FN2] In these figures, the de-header valve 12 has a body 46 and upper and lower seats, *1376 34 and 38. The upper and lower seats 34 and 38 are large metal rings whose openings line up to form a single hole. The upper seat 34 is a dynamic, live loaded seat, while the lower seat 38 is static. '714 patent, col. 8, ll. 51-62. Although not shown in figure 2, the blind, element 106 in figure 11, moves laterally within element 54. When the blind moves to the left, it opens the hole between seats 34 and 38. Thus, when the circular opening in the blind lines up with the openings in the seats, the blind is open.

[FN1] Figure 2 of the '131 patent is the formal version of figure 2 of the '714 patent, which was issued with informal figures. The two figures do not differ in any material respect.

[FN2] Figure 11 of the '131 patent is the formal version of figure 8 of the '714 patent. The two figures do not differ in any material respect.

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438 F.3d 1374, 77 U.S.P.Q.2d 1988
(Cite as: 438 F.3d 1374)

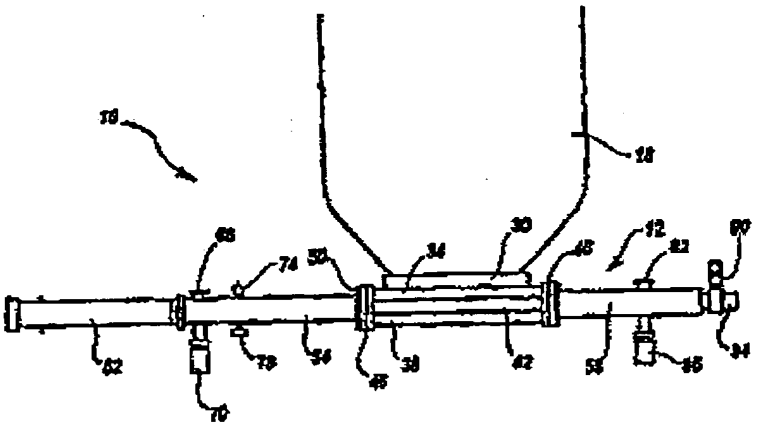

Fig. 2

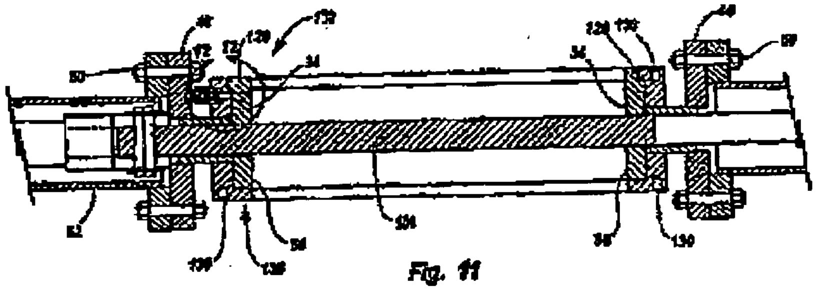

Fig. 11

The '714 patent describes the upper and lower seats, with reference to figure 2, as follows:

> In the preferred embodiment, the static seat is a one piece seat that is securely *1377 fastened to de-header valve 12 and is preferably non-adjustable. ... In contrast to the static seat, dynamic, live loaded seat is a moveable and adjustable seat that is energized from without the process stream via live seat adjustment mechanism. The function of the dynamic, live loaded seat is to provide point to point fine tuning of the system, and particularly the blind as it is sealed between upper and lower seats 34 and 38.

'714 patent, col. 9, ll. 9-19. Thus, as the blind moves between the top and bottom seats, the dynamic, live loaded seat (closest to the drum interior) exerts force downward on the blind. The invention adjusts that force to allow linear movement of the blind between the seats while keeping a tight seal on the drum. *See id.* at col. 4, ll. 17-67. In the preferred embodiment, the invention accomplishes this vital adjustment with an adjustment mechanism (the circled element in the upper-left-hand portion of figure 11). *Id.* at col. 13, ll. 43-50. The adjustment mechanism of the '714 patent functions to facilitate operation of the de-header system. *See, e.g., id.* at col. 14, ll. 50-55.

On December 16, 2004, **Curtiss-Wright** sued Velan, claiming that a Velan valve infringed the '714 patent. On March 1, 2005, **Curtiss-Wright** sought a preliminary injunction to prevent Velan from launching a new valve at an upcoming industry conference, alleging infringement of claims 14, 33 and 36 of the '714 patent. Velan's valves do not include adjustment mechanisms like those disclosed in the '714 patent. Instead, Velan's valves include upper dynamic, live loaded seats with internal biasing springs. These springs modulate the pressure on the seat to allow the blind to move. Velan designed its seats to allow replacement of these biasing springs. To change the biasing force in Velan's dynamic, live loaded seats, an operator must replace these internal biasing springs. Thus, Velan's system envisions removal of the valves from the coke drum. *Preliminary Injunction Order*, slip op. at 16-17.

Claim 14 of the '714 patent recites:

14. A coke drum bottom de-heading system comprising:
at least one coke drum containing manufactured coke therein, said at least one coke drum having a flanged bottom orifice;
a de-header valve removably coupled to said coke drum to facilitate the removal of said coke from said at least one coke drum by de-heading said at least one coke drum, said de-header valve comprising:
a main body having an [sic] flanged orifice therein for removably coupling said de-header valve to said flanged bottom orifice of said coke drum;
an upper and lower bonnet coupled to said main body;
an *adjustable* dynamic, live loaded seat coupled to said main body;
a static seat coupled to said main body in opposition to said dynamic, live loaded seat; and
a blind coupled to said main body and actuated by an actuator, said blind capable of moving in a bi-directional manner within said de-header valve between said dynamic, live loaded and static seats to control the opening and closing of said de-header valve, said blind providing a seal between said dynamic, live loaded seat and said static seat, said coke drum is de-headed, thus preparing said coke drum for the removal of said coke, by actuating said blind from a closed, sealed position, to an open position thereby causing said coke that has accumulated on said blind and within *1378 said valve to be sheared from said blind.

'714 patent, claim 14 (emphasis added).

According to the trial court, the term "adjustable" in claim 14 means that the bias force on the live loaded seat can be changed in a manner that is "not limited by any time, place, manner, or means of adjustment." *Preliminary Injunction Order*, slip op. at 16. Based on that construction, the trial court concluded that **Curtiss-Wright** had shown a reasonable likelihood of success on the merits of its infringement claim. *Id.*, slip op. at 18. The trial court observed that Velan can "adjust" the bias force by replacing the springs in its de-header valve. *Id.* After further considering irreparable harm, the balance of hardships, and the public interest, the district court granted **Curtiss-Wright's** motion for a preliminary injunction. *Id.*, slip op. at 21. Velan appeals.

II.

[1][2] "The grant of a preliminary injunction under 35 U.S.C. § 283 is within the discretion of the district court. This court reviews a preliminary injunction decision for an abuse of discretion." *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1370 (Fed.Cir.2005) (citing *Novo Nordisk of N. Am., Inc. v. Genentech, Inc.*, 77 F.3d 1364, 1367 (Fed.Cir.1996)). "The court's determination can be overturned only on a showing that it abused its discretion, committed an error of law, or seriously misjudged the evidence." *We Care, Inc. v. Ultra-Mark Int'l Corp.*, 930 F.2d 1567, 1570 (Fed.Cir.1991) (citing *H.H. Robertson, Co. v. United Steel Deck, Inc.*, 820 F.2d 384, 387 (Fed.Cir.1987)). This court reviews claim construction without deference. *Collegenet, Inc. v. Applyyourself, Inc.*, 418 F.3d 1225, 1230 (citing

Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed.Cir.1998) (en banc)); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed.Cir.1995), *aff'd*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996).

The trial court's claim construction followed a logical path. The court first set forth the ordinary meaning of "adjustable": "capable of making a change to something or capable of being changed." *Preliminary Injunction Order*, slip op. at 10. The court then determined that a narrower construction of "adjustable" would be inconsistent with other claims in the '714 patent, which recite an adjustment mechanism that allows adjustment while the device is in use or operation. *Id.* at 11-13. In other words, the district court relied on claim differentiation during its claim construction. Finally, the district court explained that any construction of the term "adjustable" that requires the presence of the adjustment mechanism disclosed in the '714 patent would be an impermissible narrowing of that claim term to the structure of the preferred embodiment.

While logical, this chain of reasoning errs because it places too much emphasis on the ordinary meaning of "adjustable" without adequate grounding of that term within the context of the specification of the '714 patent. Moreover, to the extent this reasoning relies on claim differentiation, it misapplies that limited tool of claim construction.

[3] This court recently reiterated that the specification is the single best guide to the meaning of a claim term. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed.Cir.2005) (en banc) (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed.Cir.1996)). In this case, the '714 patent's specification describes the deficiencies of the prior art, including the conventional requirement of removing the entire head unit from the coke drum during de-heading:
*1379 [The prior art] assemblies or devices require that the head unit be completely removed from the flange portion of the coke drum after each coking cycle and prior to the purging of the coke from the coke drum. This creates an extreme hazard to workers and provides an inefficient and time consuming procedure.

'714 patent, col. 2, ll. 49-54. The '714 patent specification further extols this invention for overcoming these deficiencies of the prior art:Another critical aspect of the present invention is the ability to de-head the coke drum without having to remove the head unit, and to do so at a remote location with little or no manual requirements.

Id. at col. 4, ll. 13-17. The '714 patent then associates the adjustability of the live loaded seat with that critical aspect of the invention. In other words, the patent stresses that adjustment occurs during operation and without removal of the head unit:In a normal coking process, extreme temperatures and pressures are present. Any variation in temperature between the upper and lower surfaces of the blind can cause the blind to bow. If the bowing is allowed to progress or continue, there is a danger in breaking the seal created between [the] upper and lower seats and [the] blind, which could cause damage to the system and upset the manufacturing process. However, the ability of the present invention to adjust the load exerted on [the] blind, utilizing the dynamic, live loaded seat and its adjustment mechanism, provides a way to compensate for or modulate any existing bowing that might occur. By increasing the applied load of the dynamic, live loaded seat on [the] blind, the bowing is substantially eliminated ....

Id. at col. 11, ll. 7-20 (reference numbers omitted). With respect to an alternative embodiment with multiple live loaded seats at different points along the blind, the specification explains:By allowing point to point adjustability, the system is capable of being fine tuned to decrease the chances of unwanted leaks within the system. For example, if the system were leaking at one location, any one of, or multiple, dynamic seats could be adjusted to compensate and seal the leak.

Id. at col. 15, ll. 33-37.

Thus, the specification of the '714 patent consistently, and without exception, describes adjustment that occurs during operation of the de-header system. The districts court's construction of "adjustable," which includes a structure that requires dismantling of the valve to perform the adjustment, finds no support in the overall context of the '714 patent specification.

Moreover, the district court's construction of " adjustable" renders that limitation nearly meaningless. This court finds it difficult, if not impossible, to imagine any mechanical device that is not "adjustable," under the ordinary meaning of that term adopted by the district court. Almost any mechanical device undergoes change (for instance, when dismantled to replace worn parts) when no consideration is given to the "time, place, manner, or means of adjustment."

This court commends the district court's reluctance to narrow the claims to the preferred embodiment. In this instance, however, that care is admirable but misplaced. This case does not evince a situation where a party is attempting to import a limitation from the specification into the claims. Claim 14 already contains the "adjustable" limitation. Thus, the claim construction task requires this court to discern the meaning of that term in the context of this invention and field of art. *1380 The specification provides that context and substantial guidance on the meaning of "adjustable." In light of the specification, the term "adjustable" means that the dynamic, live loaded seat can be adjusted while the de-heading system of claim 14 is in use.

The district court buttressed its broad construction of "adjustable" with a comparison to other independent claims in the '714 patent, specifically claims 1 and 18. Those claims recite an adjustment mechanism. *See Preliminary Injunction Order,* slip op. at 11-13. As the district court explained:
[B]ecause Claims 1 and 18 specifically describe an embodiment possessing [an] external seat adjustment mechanism and Claim 14 does not, the only meaning to be derived from Claim 14 is that it encompasses all devices that are simply "adjustable, " or capable of changing the bias force exerted on the sliding gate by the dynamic, live loaded seat, regardless whether these devices possess an adjustment mechanism or not and regardless of the means or time in which this adjustment is made.

Id. Thus, without using the formal label, the district court relied on claim differentiation to reach its broad meaning. The district court's misapplication of that claim construction tool is understandable given the variability of explanations of claim differentiation.

[4] In the most specific sense, "claim differentiation " refers to the presumption that an independent claim should not be construed as requiring a limitation added by a dependent claim. *See Nazomi Commc'ns, Inc. v. Arm Holdings, PLC.,* 403 F.3d 1364, 1370 (Fed.Cir.2005) ("[C]laim differentiation 'normally means that limitations stated in dependent claims are not to be read into the independent claim from which they depend.' " (quoting *Karlin Tech., Inc. v. Surgical Dynamics, Inc.,* 177 F.3d 968, 971-72 (Fed.Cir.1999))); *see also Phillips,* 415 F.3d at 1314-15 (explaining the presumption without invoking the "claim differentiation" label). Thus, the claim differentiation tool works best in the relationship between independent and dependent claims. *See Liebel-Flarsheim Co. v. Medrad, Inc.,* 358 F.3d 898, 910 (Fed.Cir.2004) (citing *Sunrace Roots Enter. Co. v. SRAM Corp.,* 336 F.3d 1298, 1302-03 (Fed.Cir.2003)). Indeed the statute stresses that a dependent claim must add a limitation to those recited in the independent claim. *See* 35 U.S.C. § 112, ¶ 4 (2000) ("[A] claim in dependent form shall contain a reference to a claim previously set forth and then specify *a further limitation of the subject matter claimed.*") (emphasis added). Thus, reading an additional limitation from a dependent claim into an independent claim would not only make that additional limitation superfluous, it might render the dependent claim invalid.

[5] Beyond the independent/dependent claim scenario, this court has characterized claim differentiation more generally, i.e., as the " presumption that each claim in a patent has a different scope." *Versa Corp. v. Ag-Bag Int'l Ltd.,* 392 F.3d 1325, 1330 (Fed.Cir.2004) (quoting *Comark Commc'ns, Inc. v. Harris Corp.,* 156 F.3d 1182, 1187 (Fed.Cir.1998)). Different claims with different words can, of course, define different subject matter within the ambit of the invention. On the other hand, claim drafters can also use

different terms to define the exact same subject matter. Indeed this court has acknowledged that two claims with different terminology can define the exact same subject matter. *Tandon Corp. v. U.S. Int'l Trade Comm'n,* 831 F.2d 1017, 1023 (Fed.Cir.1987); *Hormone Research Found. v. Genentech, Inc.,* 904 F.2d 1558, 1567 n. 15 (Fed.Cir.1990) ("It is not unusual that separate claims may define the invention using different terminology, especially where (as here) independent ***1381** claims are involved."). In this context, this court has cautioned that "[c]laim differentiation is a guide, not a rigid rule." *Laitram Corp. v. Rexnord, Inc.,* 939 F.2d 1533, 1538 (Fed.Cir.1991).

[6] With those precedents in mind, this court observes that two considerations generally govern this claim construction tool when applied to two independent claims: (1) claim differentiation takes on relevance in the context of a claim construction that would render additional, or different, language in another independent claim superfluous; and (2) claim differentiation "can not broaden claims beyond their correct scope." *Fantasy Sports Props. v. Sportsline.com,* 287 F.3d 1108, 1115-16 (Fed.Cir.2002) (quoting *Kraft Foods, Inc. v. International Trading Co.,* 203 F.3d 1362 (Fed.Cir.2000)). In this case, both of those considerations weigh against the district court's construction of "adjustable."

[7] First, reading "adjustable" to mean adjustable " on the fly" during de-heading does not render the recitation of an adjustment mechanism in other claims superfluous. Even if "adjustable" were synonymous with the presence of an adjustment mechanism, this court perceives no redundancy because the claims that recite the presence of such a mechanism do not include the "adjustable" limitation. *Compare* '714 patent, claims 1 and 18 *with* '714 patent, claim 14. As noted before, a patentee may define the same subject matter with claims having different terminology. *Mycogen Plant Sci. v. Monsanto Co.,* 243 F.3d 1316, 1329 (Fed.Cir.2001). Moreover, in-use adjustability does not necessarily mean the same thing as the presence of an adjustment mechanism. After all, an adjustment mechanism might be present but not useable during de-heading. To be clear, this court does not venture to construe the scope of the adjustment mechanism limitation in claims 1 and 18, but merely observes that the language of claim 14, as properly construed, does not appear to be commensurate with the language in claims 1 and 18. Thus, while the district court may have been correct that a device encompassed by claim 14 of the '714 patent need not have an adjustment mechanism, it went too far in completely eliminating any constraints on the "adjustable" limitation. Moreover, the district court's construction actually creates a redundancy: if " adjustable" means adjustable at any time and in any way, it is hard to imagine any meaning for the term because without limitations on time or manner of adjustment, all structures are "adjustable."

Second, relying on the claim differentiation presumption in this case contradicts the correct meaning of claim 14. As discussed above, the specification stresses that the invention is " adjustable" during de-heading. Any construction to the contrary is not consistent with the overall context of this invention and this field of art as described in the specification.

Before the district court, the dispute over **Curtiss-Wright's** showing of a likelihood of infringement centered on the recognition that Velan's valves must be dismantled for adjustment. Velan argued that its de-heading system did not infringe because the only way to adjust their live loaded seat required removal of the seat to replace its internal biasing springs. The district court rejected that argument because its construction of "adjustable" placed no meaningful limits on that term. Because the district court erred in its claim construction, its subsequent infringement analysis in the context of **Curtiss-Wright's** motion for a preliminary injunction was flawed. Accordingly, the district court's grant of the preliminary injunction was an abuse of discretion.

CONCLUSION

Because the district court erred in its claim construction, this court vacates the ***1382** district court's grant of **Curtiss-Wright's** motion for a preliminary injunction and remands for action consistent with the opinion.

COSTS

Each party shall bear its own costs.

VACATED and REMANDED

C.A.Fed.,2006.
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438 F.3d 1374, 77 U.S.P.Q.2d 1988

Briefs and Other Related Documents (Back to top)

- 2005 WL 1843179 (Appellate Brief) Reply Brief of Defendant-Appellant Velan, Inc. (Jul. 15, 2005) Original Image of this Document (PDF)
- 2005 WL 1923489 (Appellate Brief) (Corrected) Brief of Plaintiff-Appellee Curtiss-Wright Flow Control Corp. (Jul. 08, 2005) Original Image of this Document (PDF)
- 2005 WL 1486731 (Appellate Brief) Brief of Defendant-Appellant Velan, Inc. (Jun. 02, 2005) Original Image of this Document with Appendix (PDF)
- 05-1373 (Docket) (May. 03, 2005)

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